



**DESIGN AND DEVELOPMENT OF AN
AUTOMATIC SWITCH TO REDUCE ELECTRIC
USAGE IN LECTURE ROOM**

**AHMAD ZAKWAN BIN ABD LATIFF
(2013638766)**

**BACHELOR OF MECHANICAL ENGINEERING
(MANUFACTURING) (HONS.)**

UNIVERSITI TEKNOLOGI MARA (UiTM)

JANUARY 2017

“I hereby declare that this thesis is based on my original work except for the quotations and citations, which have been acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UiTM or other institutions.”

Signed : _____

Date : _____

AHMAD ZAKWAN BIN ABD LATIFF

UiTM ID: 2013638766

“I declared that I read this thesis and in my point of view this thesis is qualified in term of scope and quality for the purpose of awarding the Bachelor of Mechanical Engineering (Manufacturing)(HONS)”

Signed:

Date:

Supervisor

EN BAKRI BIN ALI

Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)
13500 Permatang Pauh
Pulau Pinang.

ACKNOWLEDGEMENT

In the name of ALLAH the most gracious and most merciful, Alhamdulillah thanks to Allah SWT for giving me strength to complete all the task in this study. I would like to take this opportunity to extend my enduring gratitude and appreciation to my dearest supervisor **Mr. Bakri Bin Ali** whose expertise, consistent guidance, ample time spent and regular advice that helped him bring this study into success. I would also like to thanks to **Mr. Asri (Electrical)** from Unit Facility for his expertise and cooperation to give me a data of electric cost in UITMPP and blueprint of electrical in BKBA building. I also would like to record my appreciation to **Mr. Ehsan (Mechanical)** also from Unit Facility for his cooperation to give me data about air conditioning system in BKBA building. Special gratitude also to **Mr. Mohd Syamim** for patiently teaching me how to use the Arduino to make this project work and done. This thesis would not have been completed favorably without the excellent moral support through many ups and down from my beloved parents, **Mr. Abd Latiff Bin Zainol Abidin** and **Mrs. Raja Maznah Binti Raja Abdul Malek**. And lastly to all my friends and classmates for guiding and helping me to make the project well-done achievement.

ABSTRACT

The purpose of this study is to investigate the current wastage in UiTM Pulau Pinang and to design a device that can reduce the wastage of electricity in UiTM Pulau Pinang because of a too high electricity bill. The lecture room in BKBA building is taken as a sample because it is likely one of the main causes of wastage when the air conditioner and lighting are on when the room is empty. An observation was made in a selected lecture room, and it confirms that there is a significant wastage in the lecture room. From the observation, it shows that the total of wastage in 1st-floor lecture room is 24 hours in a week (252 lecture hours) equal amounting to 9.52% from the scheduled class. This is equal to 49.896 kWh total wastage in a week. An automatic switch is design and developed to reduce this wastage. The circuit was electronically controlled using Arduino Nano that will set the timer for 1 or 2 hours when using the lecture room. Therefore the system will cut off the electricity once the time reached and the buzzer will produce a sound to alert student and lecturer to warn the class is over and the air conditioner and lighting will be off. Prior to that the electrical wiring and air-conditioner system is examined so that a proper circuit can be designed to withstand the rated current. As a conclusion, an automatic switch can reduce the wastage of electricity in UiTM especially in the lecture room. It also can reduce the total electricity expenditure.